APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/322,443	05/28/1999	DAVID L. REESE	005231/06-4003	8015

7590 11/21/2003	EXAMINER
ATTEN: DAVID E. BOUNDY	DAS, CHAMELI

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ART UNIT	PAPER NUMBER
2122	

DATE MAILED: 11/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/322,443	REESE ET AL.
	Examiner	Art Unit	
	C. DAS	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 September 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-81</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-4,7,16,23,34-37,43-45,48-65,67-69 and 76-81</u> is/are rejected.

7)☒ Claim(s) <u>5,6,8-15,17-22,24,25,30-33,38-42,46,47,66 and 70-75</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:
        1.☐ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2,3,5,8</u> .	6) ☐ Other: .

U.S. Patent and Trademark Office

PTOL-326 (Rev. 11-03)   Office Action Summary   Part of Paper No. 13

1.   In view of the applicant's response regarding restriction requirement filed on

9/5/03, the restriction requirement made in the previous office action is hereby

withdrawn.

2.   Claims 1-81 are pending.

Specification

3.   The abstract of the disclosure is objected to because the first sentence of the

Abstract "A computer" is an incomplete sentence. Correction is required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-4,7,16,34 are rejected under 35 U.S.C. 102(a) as being anticipated by

Lewchuk, US 6,047,363.

As per claim 1, Lewchuk discloses:

- executing a program in a logical address space of a computer (col 2, lines 47 –

58), where the address is the logical or virtual address (col 4 lines 67 – col 5 lines 2),

and (col 5 lines 10-11)

- with an address translation circuit translating address references generated by

the program from the program's logical address space to the computer's physical

address space (col 5 lines 10-18, col 5 lines 30-35)

- recording profile information that records physical memory addresses

referenced during execution interval of the program (col 6 lines 33-40, col 5 lines 30-35

and col 5 lines 55-65).

As per claim 2, Lewchuk discloses:

- the recorded phy;sical memory reference include addresses of binary

instructions referenced by an instruction pointer (col 2 lines 45-65, col 5 lines 54-65)

- at least one of the recorded instruction references records ... a page boundary

in the address space (Abstract, lines 1-5, col 5 lines 23-35)

As per claim 3, Lewchuk discloses:

- the recorded phy;sical memory reference include addresses of binary

instructions referenced by an instruction pointer (col 2 lines 45-65, col 5 lines 54-65)

- at least one of the recorded instruction references... external interrupt (col 5 lines 23-

35).

As per claim 4, Lewchuk discloses:

 - the recorded phy;ical memory reference include addresses of binary instructions

referenced by an instruction pointer (col 2 lines 45-65, col 5 lines 54-65)

-    at least one of the recorded instruction ... profiled execution interval (col 15 lines

     14-21).

For claim 7, (Lewchuk col 8 lines 50-65, col 15 lines 15-20).

As per claim 16, Lewchuk discloses:

-    executing a program on a computer, the program referring to memory by virtual

     address (col 4 lines 65-67 and col 5 lines 1-15)

concurrently with the execution ... profiled memory references (col 4 lines 65-67,

and col 5 lines 1-15, col 6 lines 33-40, col 5 lines 30-35 and col 5 lines 55-65).

For claim 34, Lewchuk discloses: program bas been compiled .. execution

interval (Abstract col 6 lines 35-45, col 7 lines 20-42).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Lewchuk, US 6,047,363 and further in view of Aoshima, US 5,210,859.

As per claim 23, Lewchuk discloses:

- *the program has been compiled .. for execution profiling* (col 6 lines 33-40,

col 5 lines 30-35 and col 5 lines 55-65).

Lewchuk does not specifically disclose source and destination of a control flow event in

which ... diverges from sequential flow. However, **Aoshima discloses** source and

destination of a control flow event in which ... diverges from sequential flow (col 10 lines

56-68). The modification would be obvious because one of the ordinary skill in the art

would be motivated to record the profile information efficiently.

6.   The following claims are rejected under 35 U.S.C. 103(a) as being unpatentable

over Lewchuk, US 6,047,363 and further in view the article "Using Branch Handling

Hardware to Support Profile-Driven Optimization" author: Conte et al, published on ACM, 1994.

   As per claim 25, Lewchuk discloses program is executed on a computer, profile circuitry configured to detect the occurrence of profileable events ... detecting and recording profile (Abstract, col 2 lines 43-67).

Lewchuk does not specifically disclose an instruction pipeline. However, the background section of Lewchuk discloses the instruction pipeline (col 1 lines 18-22). The modification would be obvious because one of the ordinary skill in the art would be motivated to improve the performance of the overall execution of the instructions.

Lewchuk disclose recording profile (Abstract and col 6 lines 33-40).

Lewchuk does not specifically disclose recording profile under hardware control without software intervention. However Conte in his article discloses recording profile under hardware control without software intervention (page 13, col 1 lines 12-25 and page 14 section 2.3 "The drawbacks of software profiling"). The modification would be obvious because one of the ordinary skill in the art would be motivated to obtain the system with high accuracy and small slowdown in execution (Conte, abstract).

   As per claim 26, Lewchuk does not specifically disclose profile information is recorded into general registers... main memory. However, Conte in his article discloses profile information is recorded into general registers... main memory (page 15, section 3.2, lines 2-12, page 14, section 3). The modification would be obvious because one of the ordinary skill in the art would be motivated to obtain the system with high accuracy and small slowdown in execution (Conte, abstract).

For claim 27, Lewchuk discloses: recorded profile information... execution

interval (Abstract, col 15 lines 14-21). Conte discloses without reference to the binary

code of the program. Conte's article teaches the recording profile information without

software inherently including without reference to the binary code of the program.

For claim 28, 45, 52, 65, Lewchuk discloses recording profile information ... by

the program (Abstract, col 6 lines 25-40). Lewchuk does not specifically disclose time

independent profileable events.   Official notice is taken for time independent profileable

events. The modification would be obvious because one of the ordinary skill in the art

would be motivated to track the profile events as independent functions.

For claim 29, Lewchuk discloses individual record ... record the event code

(Abstract, col 15 lines 14-21). Lewchuk does not specifically disclose record the event

code being less than log2. Official notice is taken to take the number of bits less than

log2 for recording events. The modification would be obvious because one of the

ordinary skill in the art would be motivated to keep less space for recording events.

For claim 35, 43 see the rejection of claim 25 above.

For claim 36, 44, 53 see the rejection of claim 26 above.

For claim 37, (Lewchuk, col 4 lines 53-67).

For claim 48, (Lewchuk, col 6 lines 13-48).

For claim 49 (Lewchuk, abstract, col 1 lines 15-21).

For claim 50 (Lewchuk, col 1 lines 15-21, col 10 lines 10-25, Fig 9).

For claim 51 (Lewchuk, abstract, col 6 lines 11-40).

For claim 54 (Lewchuk, abstract, col 6 lines 25-40, col 5 lines 43-50) and (Conte,

Abstract).

For claim 55 (Conte, page 13, col 2 lines 1-10) and (Lewchuk, col lines 25-30).

For claim 56 (Lewchuk, col6 lines 1-25).

 For claim 57   (Lewchuk, col 6 lines 65- col 7 lines 1-10)

 For claim 58   (Lewchuk, col 6 lines 1-10).

For claim 59 (Lewchuk, col 4 lines 53-65).

For claim 60 (Lewchuk, col 4 lines 53-67 col 5 lines 1-12).

For claim 61 (Lewchuk, col 4 lines 53-65 and col 10 lines 63-67 and col 11 lines 1-10).

For claim 62, see the rejection of claim 23 above.

For claim 63, Lewchuk discloses recording profile information. Lewchuk does not

dislcoses the meaning of the binary instruction of the computer. However, Conte

discloses the meaning of the binary instruction of the computer (Conte, page 15 lijes

section 3.2). The modification would be obvious because one of the ordinary skill in the

art would be motivated to determine the actual history of the execution to record the

profile information efficiently.

For claim 64, Lewchuk discloses recording profile information. Lewchuk does not

dislcoses the change to a full/empty mask for registers of the computer. However,

Conte dislcoses the change to a full/empty mask for registers of the computer (Conte,

page 15 lijes section 3.2). The modification would be obvious because one of the

ordinary skill in the art would be motivated to determine the actual history of the

execution to record the profile information efficiently.

For claim 67, Lewchuk discloses an instruction ... logical address space of a memory of

the compuer (Abstract, col 4 lines 65-67 and col 5 lines 1-15)

address translation circuit ... physical address space (Lewchuck, col 5 lines 1-20),

record profile information ... program (col 6 lines 25-40).

Lewchuck does not disclose the instruction pipeline. However, the background section

of Lewchuk dislcoses the instruction pipleline (col 1 lines 15-25).   The modification

would be obvious because one of the ordinary skill in the art would be motivated to

achieve the high execution performance.

Lewchuk does not specifically disclose without compiler assistance. However, Conte in

the article discloses the hardware profiling without any software intervention (Conte,

page 14, section 2.3 and section 3). The modification would be obvious because one

of the ordinary skill in the art would be motivated to perform hardware base profiling for

high accuracy with small slowdown execution for high performance system.

For claim 68, (Lewchuk, col 4 lines 55-65, col 6 lines 1-20).

For claim 69, (Lewchuk, col 15 lines 10-20).

For claim 74 (Lewchuk, col 4 lines 55-65).

For claim 76 see the rejection of claim 25.

For claim 77 see the rejection of claim 26.

For claim 78 see the rejection of claims 25 and 26.

For claim 79,(Conte, page 14, section 3, page 15, section 3.2).

   Claims 80-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Lewchuk, US 6,047,363 and further in view the article "Using Branch Handling

Hardware to Support Profile-Driven Optimization" author: Conte et al, published on

ACM, 1994 and Yates et al, US 5,802373.

For claims 80 and 81, Lewchuk and the background section discloses the instruction

pipeline is configured to execute instruction. Lewchuk does not specifically disclose

native and non-native instruction set providing access to all of the resources of the

computer. However, Yates (in US 5,802373) discloses native and non-native instruction

set providing access to all of the resources of the computer (Abstract). The modification

would be obvious because one of the ordinary skill in the art would be motivated to

record the profile in formation for the instruction which runs in different operating

system.

Allowable Subject Matter

Claims 5-6,8-15, 17-22, 24-25,30-33, 38-42, 46-47, 66, 70-75 are objected to as

being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening

claims.

Any inquiry concerning this communication or earlier communications from the   examiner

should be directed to Chameli Das whose telephone number is 703-305-1339.

The examiner can normally be reached on Monday-Friday from 7:00 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor Tuan Dam can be reached at 703-305-4552. The fax number for this group

are:

(703) 872-9306 (official fax), (703) 746-7240 (non-official/draft), (703)746 -7238 (after

final).

An inquiry of general nature or relating to the status of this application or proceeding

should be directed to the group receptionist whose telephone number is 703-305-9600.

Chameli C. Das

Primary Patent Examiner

Art Unit 2122

11/15/03